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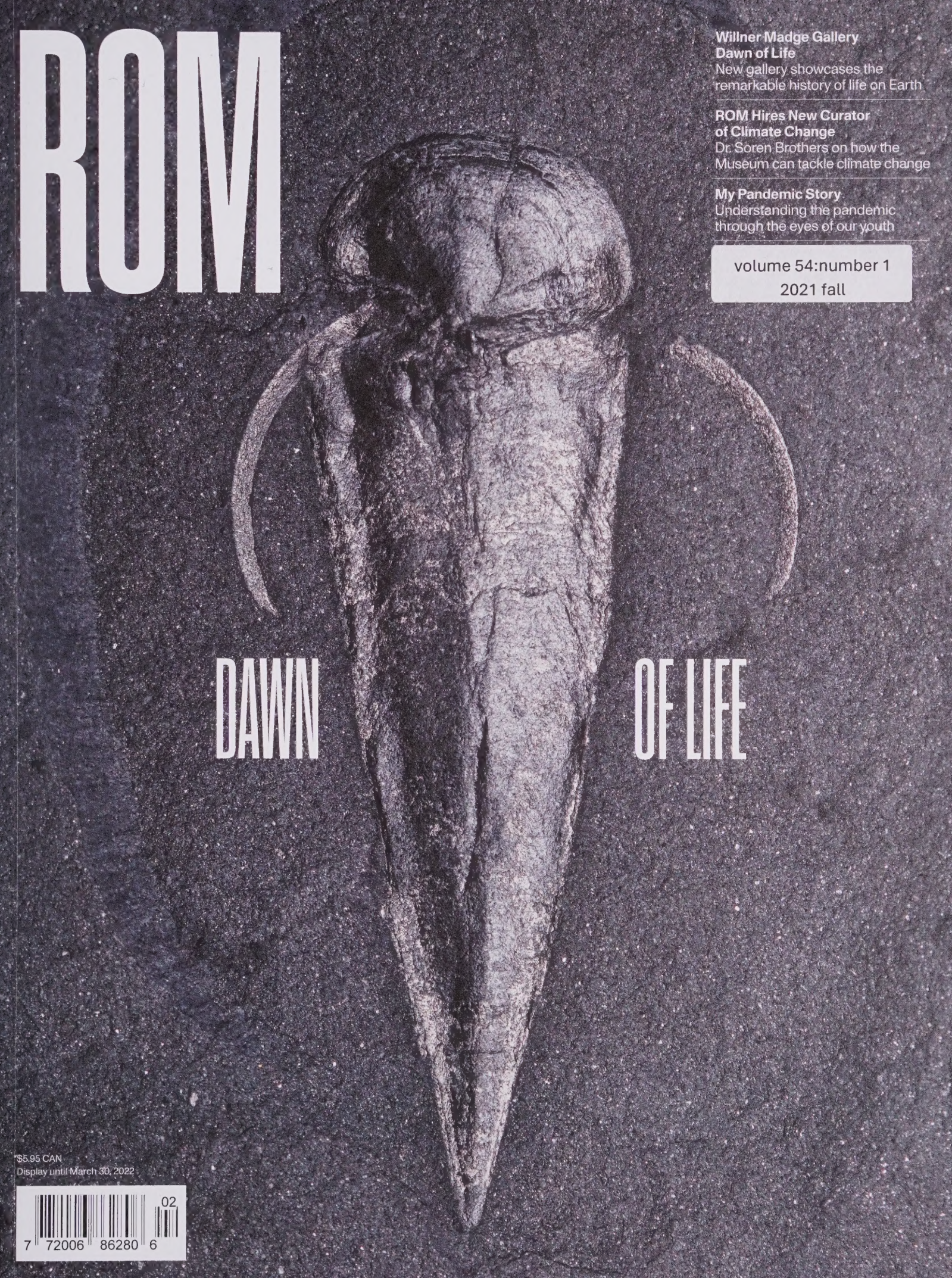

Willner Madge Gallery Dawn of Life
New gallery showcases the remarkable history of life on Earth

ROM Hires New Curator of Climate Change
Dr. Soren Brothers on how the Museum can tackle climate change

My Pandemic Story
Understanding the pandemic through the eyes of our youth

volume 54:number 1
2021 fall

DAWN OF LIFE

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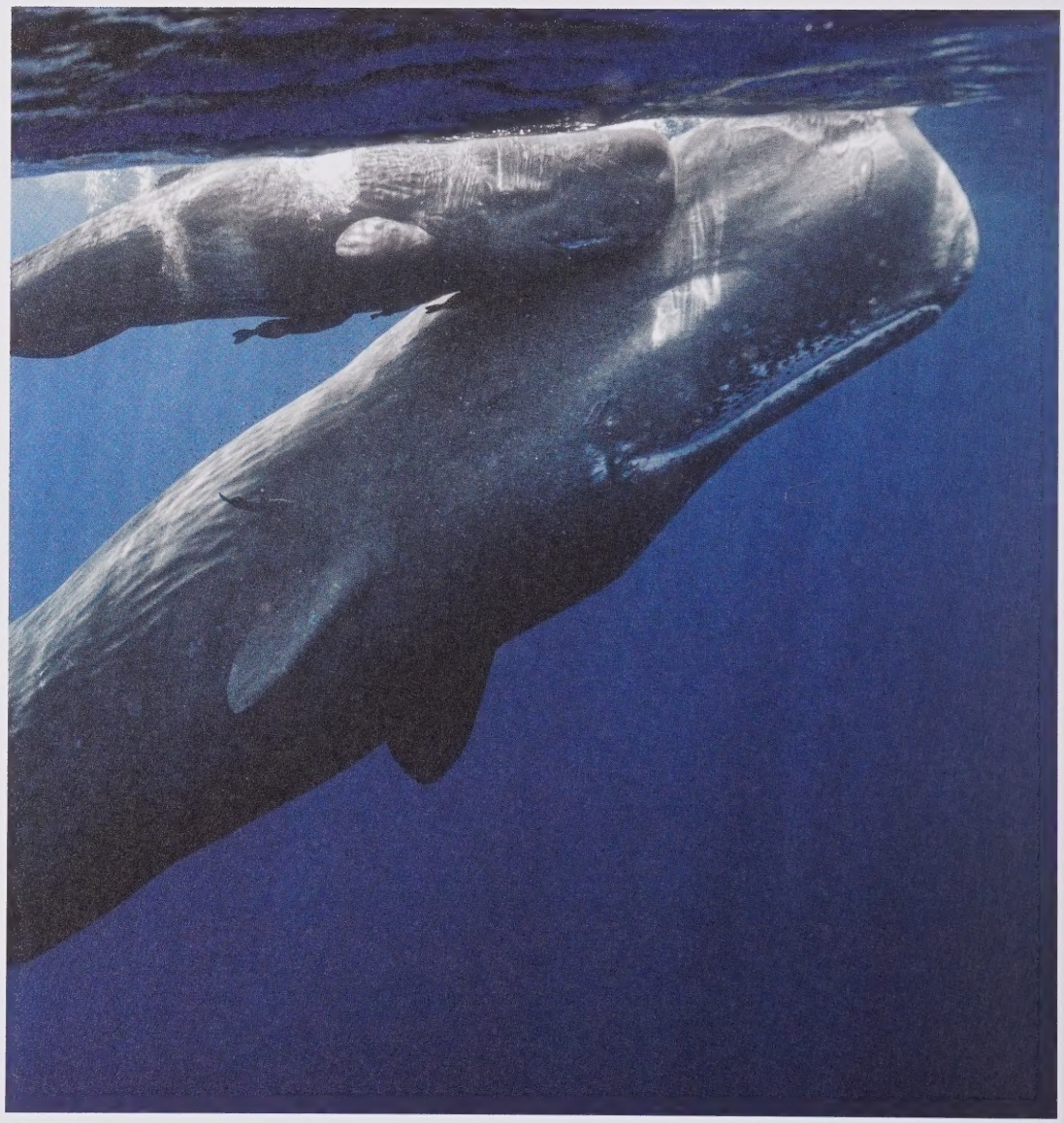
Great Whales
Up Close and Personal

WHALES



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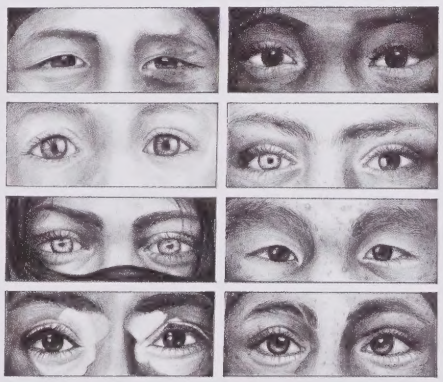

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Eyedentity, on loan from the artist, Sabrina.

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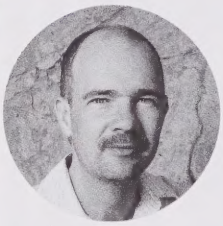

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Haddrath is responsible for one of ROM's two DNA labs and the new Ancient Genomics Lab, where the genomes of modern and historical blue whales have recently been sequenced to learn about the impacts of whaling.

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THE EPIC STORY OF LIFE ON EARTH

ROM is a storyteller, chronicling 4.5 billion years on Earth through art, culture, and nature. In this tradition, we bring you the Willner Madge Gallery, Dawn of Life, a spectacular new permanent gallery—and the origin story for life itself.

Anchored by a stunning collection of fossils from UNESCO World Heritage sites across Canada, Dawn of Life traces the long journey from the first microbes to the ascent of reptiles and mammals. In the origin story of life, these fossils are indispensable characters—imprints of ancient algae and oceanic predators, which immerse us in an alien, prehistoric Earth.

Throughout this sprawling story of life, you will also learn of death: four mass extinctions, the most devastating of which obliterated 90 percent of marine life and 70 percent of terrestrial life. This brings us to our present moment: the sixth mass extinction, one entirely of our own making.

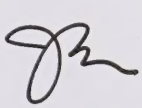
As oceans rise, forests burn, and species die, many of us are unable to comprehend the enormity of it all. This is where museums like ROM can contribute. With the ROM-original *Great Whales: Up Close and Personal,* the threat of extinction turns from abstract to intimate as you learn of the many threats against these extraordinary marine mammals. With the returning *Wildlife Photographer of the Year,* you can see the stunning beauty of nature in all its vividness—a potent reminder of everything at stake—as well as poignant images of wildlife under stress.

This fall, we welcomed Dr. Soren Brothers as the inaugural Allan and Helaine Shiff Curator of Climate Change—the first role of its kind in any major museum. Working across disciplines and collections, Dr. Brothers will deepen public understanding of the climate crisis and the need for urgent action.

Yet while climate change may pose the greatest risk to life on Earth, I would be remiss not to mention another present threat: the ongoing COVID-19 pandemic. Here, too, ROM has a role to play. *Unmasking the Pandemic,* a ROM-original exhibition, includes 100 masks from more than 20 countries showcasing the creativity that has been devoted to this now-ubiquitous garment. *My Pandemic Story*—its companion and the first crowd-sourced exhibition in ROM history—features art from youth across Ontario, presenting a rousing story of art's power in the face of illness and isolation.

Being a twenty-first-century museum, our mission is not merely to gaze into the past. It is to learn from it, to see the world as it is, to shape a joint future. And within that mission are infinite stories to tell.

So allow me to tell just one more: a farewell. In the coming months, Susan Horvath, President and CEO of ROM Governors, will retire. Since joining ROM in 2014, Susan has redefined what is possible in philanthropy, raising the Museum to new heights in the process. And while she will no longer be at ROM, the impact of her work will be felt for many years to come.



Josh Basseches
ROM Director and CEO

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Great Whales: Up Close and Personal
Closes March 20, 2022

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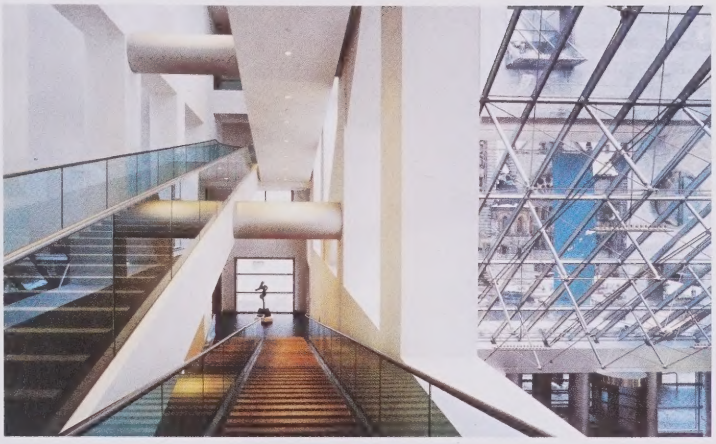

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For more information, visit rom.on.ca/reciprocal.

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Call the Gardiner Museum for more details at 416.586.8080.

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KOREAN ART IN FOCUS

ROM signs landmark five-year partnership with Korea

MORE THAN A CENTURY AFTER acquiring its first Korean artwork—a large thirteenth-century inlaid celadon vase—ROM has become the first museum in Canada to establish a curatorship for Korean Art & Culture. In July, the Museum signed a five-year agreement with the Ministry of Culture, Sports and Tourism of the Republic of Korea, which will provide one million dollars in funding to support a Curator of Korean Art & Culture as well as funds for research and public programming.

The curator will oversee, grow, and interpret ROM's world-class collection. The funding will support programs, installations, and other initiatives to introduce new audiences to the art and culture of Korea.

"ROM has the largest Korean art collection of any museum in North America," said Keung Ryong Chang, Ambassador of the Republic of Korea to Canada. "This partnership signals our commitment to strengthening our bilateral relationship in the years to come."

Prior to this partnership, ROM received a grant from the Korean government supporting the expansion of a new suite of audio guides. Now, with just a few taps on their phone, users can virtually tour areas like the Korea gallery—in English, French, or Korean—where they can see and learn about great works, including an exquisitely crafted silver gilt sheath from the 1100s. Combining photographs with clear text and narration, these guides help make ROM accessible to almost anyone, anywhere. And thanks to this grant, other existing English-and-French guides are being translated into Korean, so even more people can enjoy the Museum.

Explore the guides at mobileguide.rom.yourcultureconnect.com.

MASSIVE NEW SPECIES DISCOVERED

ROM palaeontologists unearth one of the largest radiodonts of the Cambrian explosion

ROM SCIENTISTS RECENTLY UNCOVERED the remains of a huge new fossil species.

Named *Titanokorys gainesi,* this new species is remarkable for its size. With an estimated total length of half a metre, *Titanokorys* was a giant compared with most animals that lived in the seas at that time, which barely reached the size of a pinky finger.

"The sheer size of this animal is absolutely mind boggling. This is one of the biggest animals from the Cambrian period ever found," says Dr. Jean-Bernard Caron, ROM's Richard M. Ivey Curator of Invertebrate Palaeontology.

Evolutionarily speaking, *Titanokorys* belongs to a group of primitive arthropods called radiodonts. Like all radiodonts, *Titanokorys* had multi-faceted eyes; a pineapple slice–shaped, tooth-lined mouth; a pair of spiny claws below its head to capture prey; and a body with a series of flaps for swimming. Within this group, some species also possessed large conspicuous head carapaces, with *Titanokorys*'s being one of the largest ever known.

Why some radiodonts evolved such a bewildering array of head carapace shapes and sizes is still poorly understood and was likely driven by a variety of factors, but the broad, flattened carapace form in *Titanokorys* suggests this species was adapted to life near the sea floor.

The discovery was made in the half-a-billion-year-old Cambrian rocks from Kootenay National Park in the Canadian Rockies, and the fossil will be on display along with other fascinating finds in the upcoming Willner Madge Gallery, Dawn of Life, which opens in December this year.

This discovery was one of the most widely covered research stories in ROM history.

Check out the *New York Times* story on *Titanokorys* at nytimes.com/2021/09/08/science/cambrian-fossil-radiodont.html.

CHATTING WITH WHALES

A look at the unique survival tactics of sperm whales and the possibility of communicating with them

By **Oliver Haddrath**

SPERM WHALES ARE ONE OF THE MOST ICONIC, recognizable whale species. These whales have made it into popular culture, with their history as a target of the whaling industry, their depictions battling giant squid in children's books, and the seminal impact of Herman Melville's *Moby-Dick.*

While not the largest whale—that distinction goes to the blue whale—the sperm whale is the largest toothed whale and the largest toothed predator alive today. The males average about 16 metres (52 feet) in length (longer than a bus), but some can reach over 20 metres (66 feet).

Long suspected of being intelligent animals, sperm whales have brains that are nearly six times the size of ours. And while we may dismiss that comparison given the size of the whales, their brains are larger than would be predicted for their body size. Based on a recent study involving two stranded female sperm whales, sperm whale brains are the largest in the world—even larger than those of the blue whales, who are three times their mass. The surface of the sperm whale brain is highly folded, just like in humans, and densely packed, a characteristic often correlated with intelligence.

Sperm whales are a species with many unique features that have made them superbly adapted to the environment they inhabit. They are one of the deepest-diving mammals. A sperm whale dive can last more than an hour and reach depths in excess of two kilometres in the search for squid, a favourite prey.

To be able to find food at a depth where no light can penetrate, these whales have evolved a powerful echolocation system. They produce "clicks" that move out through the water, and whales listen for sound reflected off objects to build up a mental image of their surroundings. Sperm whales are the loudest animals on the planet, and their echolocation clicks can register 236 dB—100 times louder than a 1 tonne TNT bomb exploding at close range. Whalers in the 1800s referred to sperm whales as "carpenter fish" because their clicks sounded like hammering on the ship's wooden hull.

The spermaceti organ in the sperm whale's head helps in echolocation, aiding click generation and focus. Spermaceti is an oil-rich organ, and it is this oil that fuelled the demand for hunting sperm whales. In the early-to-mid-19th century, a time before kerosene lamps and electric lights, whale oil from a variety of whale species was used to light up the world. Oil from sperm whales was especially valuable because it produced a nearly smokeless flame in oil lamps. It was also a superior lubricant for keeping machinery running during the

Sperm whales' behaviour changed due to whaling. They abandoned their normal defensive strategy of grouping together because it made them easy targets for harpoons. They also began to flee upwind, which made it harder for ships with sails to follow. The whales were communicating and learning from the experiences gained from other social groups of sperm whales.

Industrial Revolution before the development of petroleum products.

Sperm whales are linked to another highly valued commodity: ambergris, a by-product of their diet. Sperm whales eat their prey whole, including hard parts, such as squid beaks. Occasionally, these move past the stomach into the more sensitive intestines. When this happens, the sharp parts become coated with a secretion to protect the whale's organs. The resultant solid waxy mass is called ambergris.

The great commercial value of ambergris is that it can function as a fixative for perfumes, allowing the scent to last much longer. While the trade in ambergris is no longer legal in the United States and synthetic substitutes are now available, some countries still use it. A group of Yemeni fishermen found a dead sperm whale floating in the Gulf of Aden earlier in 2021, and the ambergris they recovered from the whale sold for $1.5 million (US).

The hunting of sperm whales from the 1800s up until the international whaling moratorium in 1986 took a great toll, reducing the worldwide population from more than one million whales to about 300,000 today. They are listed as vulnerable throughout most of their range under the International Union for Conservation of Nature Red List of Threatened Species; however, a genetically distinct subpopulation in the Mediterranean is classified as endangered as it numbers 2,500 individuals and is under persistent threat from ship strikes and fishing gear entanglement.

Along with emitting echolocation clicks, sperm whales produce sounds called "codas" which appear to be for social communication, and different social groups, or clans, have different dialects. Social groups consist of adult females and their offspring and may contain multiple families. These social groups are highly stable, and research over the last few decades has revealed that their social interactions can be quite complex. Increasingly, the term "culture" is being applied to these whales in the sense that they learn from each other. A research paper published in early 2021 examined the nineteenth-century whaling records for sperm whales in the North Pacific. The records revealed that within a couple of years of whaling in new waters, the whalers would see their success rates drop by 58 percent. The researchers wanted to know what caused the change. Assuming the whalers weren't less competent, were whales learning from their own individual experiences, or somehow communicating threats and defensive countermeasures to each other?

The whalers had recorded that the sperm whales' behaviour changed due to whaling. They abandoned their normal defensive strategy of grouping together, a tactic they used to fend off natural predators like killer whales, because it made them easy targets for harpoons. They also began to flee, especially upwind, which made it harder for ships with sails to follow. Sometimes, they even attacked the small boats used to chase them.

The researchers concluded that the change in behaviour happened so rapidly that the best explanation for what had taken place was not just learning from individual experience, but that these whales were communicating and learning from the experiences gained from other social groups of sperm whales.

The encouraging news from this is that sperm whales do learn and modify their behaviour when exposed to new hazards. This may help them avoid some human-made threats, although others, like underwater seismic air gun blasts used by the energy exploration industry, cannot be avoided, and need human intervention.

The growing evidence for the intelligence of this species and its ability for social learning has inspired an ambitious initiative involving National Geographic, multiple universities, Google Research, and the Government of Dominica called Project CETI (Cetacean Translation Initiative). Started in early 2021, this project shares some objectives with the similar-sounding SETI (Search for Extraterrestrial Intelligence) program, which has spent decades listening to radio signals from space in search of evidence of intelligent life beyond Earth. Project CETI began with an intelligent species already identified and will spend the next five years using robotic recording buoys to collect the calls of sperm whales, track their movements, and try to decode their calls and understand their communication by means of linguistics, cryptology, and artificial intelligence.

While attempts have been made in the past to try and decipher whale calls, today's cutting-edge technology involving powerful computers with machine learning gives us our best opportunity to decode their communications. It also raises the possibility of us being able to communicate with sperm whales. The possibility of being able to talk to another intelligent species would have a profound impact on our understanding of our place in the world and hopefully broaden and intensify our efforts to conserve these unique mammals.

Great Whales: Up Close and Personal is on display until March 20, 2022. For tickets, visit rom.on.ca.

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HOW DOES A MUSEUM TACKLE CLIMATE CHANGE?

ROM's new climate change curator on coming home to Toronto, debunking myths, and inspiring action

Interviewed by **Sheeza Sarfraz**
Photography by **Saty & Pratha**

AS THE INAUGURAL ALLAN AND HELAINE SHIFF Curator of Climate Change, Dr. Soren Brothers weaves the urgency of a planet in peril into ROM-original exhibitions and programming. That alone is ambitious, but his bigger goal is even more so: deepening public understanding of climate change to help steer us toward a more sustainable future.

Here, Dr. Brothers talks about his vision for the role and why ROM is well positioned to engage the public in conversation on a topic that is affecting our present and changing our future.

Welcome to ROM, Soren. What's it like returning to Toronto after so many years abroad? It's incredible being back home again, close to family and friends. Living abroad for so many years, I've also appreciated the perspective I've gained on the cultural richness of this region's Indigenous history, including the beauty of local languages, arts, and cultures, none of which was taught to me when I was a student growing up here.

How will visitors' own experiences of climate change inform how you explore the subject at the Museum? I would certainly like to see visitor experiences playing a major role in future ROM climate change programming. Creating a space for dialogue about climate change—allowing ROM visitors to share their stories, for instance—is a powerful way to bring home the understanding that climate change is something that we are all affected by, while increasing our understanding of the many ways that climate change is playing out around the world.

You're an expert in limnology, a multidisciplinary study of inland aquatic ecosystems like wetlands, streams, and rivers. How does this background prepare you to talk about climate change? My background has helped me visualize systems on a whole-ecosystem scale, understanding how interactions between components, including positive or destructive feedback loops, can shape the way systems change over time. For instance, regime shift theory in limnology— how lakes can switch suddenly between self-stabilizing clear and turbid states—has shaped our understanding of planetary tipping points and social dynamics.

In terms of climate change, it's beneficial to speak to this dynamic in socio-environmental systems, like the ways in which the world's moving parts are all interconnected.

Societies can potentially "double down" on destructive behaviours when the consequences of their actions become apparent, creating a destructive feedback loop. Understanding this dynamic through the lens of limnology could help us plan effective climate change communication strategies that minimize the possibility that societies double down on fossil fuels.

Have you seen the effects of climate change in your own research? Absolutely. Lakes have been termed "sentinels of climate change," as both long-term monitoring data and paleolimnological studies (analyses of sediment cores retrieved from lakes) have shown the effects of climate change. For instance, there have been studies of lake sediment cores in remote Arctic Canadian lakes showing increasing algal biomass dating back to at least the 1950s, and I recently published a study examining long-term trends in carbon dioxide emissions from Nunavut lakes. Lake water temperatures are widely on the rise, but other aspects of climate change, such as changing wind speeds, precipitation, cloud cover, and ice cover duration, are also influencing the ecological communities in lakes.

After decades of climate change inaction, we can no longer afford mere incremental change. How can the Museum best convey the urgency of this issue and help visitors differentiate between sound science and spin? Engaging the public in dialogue on climate change, including debunking myths, is something ROM is ideally situated for. One major challenge will be communicating the urgency in a way that inspires action rather than fear alone.

The questions being asked and investigated by climate change scientists around the world are fascinating and exciting, and I plan to work directly with these researchers to make sure that the information on climate change presented in ROM programs reflects the current scientific consensus.

It's worth keeping in mind that individual carbon footprints are strongly linked to socioeconomic status and not necessarily one's understanding of (or concern about) climate change. So to trigger the real, urgent changes that you're referring to, I plan to also develop ROM programs that will work directly with outside partners, including government and non-governmental agencies, to improve and expedite climate mitigation and adaptation initiatives in Ontario and beyond.

I plan to establish a trustworthy climate change program that brings the public together, regardless of political ideologies, to support the necessary structural changes required to bring our society rapidly to net zero emissions.

How can ROM foster personal involvement and the understanding that individual actions can be a catalyst for collective change? Museums are a great channel for empowering the public. Miranda Massie's Climate Museum in New York City, for instance, has a youth program in which children can write letters to their political representatives urging climate action.

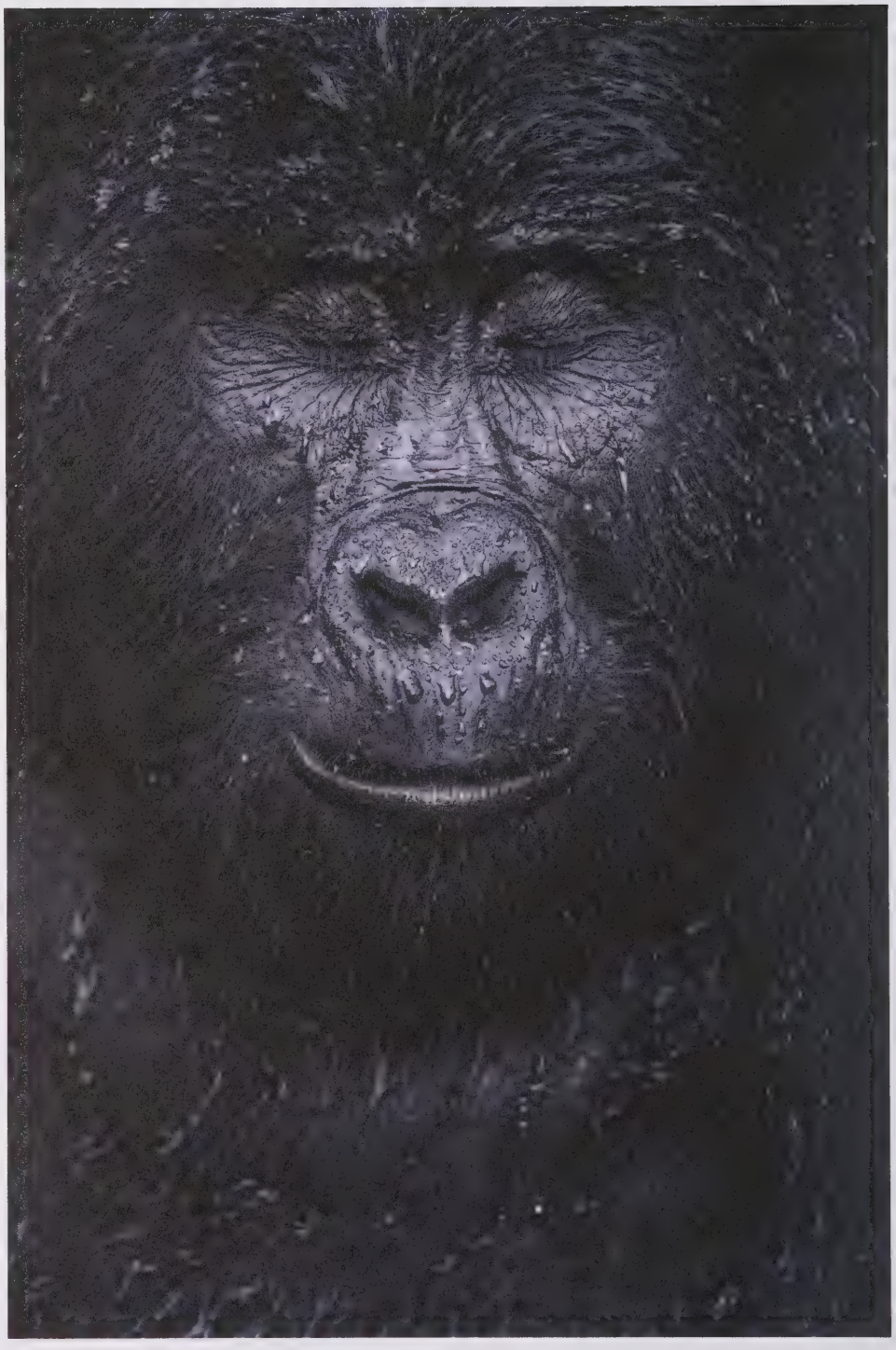
I'm interested in creating such spaces and opportunities for individual voices to be expressed through ROM climate change programs. But I also want to make sure that these voices are heard and understood by the corporations, organizations, and government offices who have the most power to bring about meaningful, rapid change.

Sustainable funding for a sustainable future
The Allan and Helaine Shiff Curatorship of Climate Change is made possible by the generous support of Allan and Helaine Shiff and a matching gift from the Louise Hawley Stone Charitable Trust. For information about supporting this project or other important initiatives at the Museum, please contact Marilyn Brown, ROM Governors Vice President, Philanthropy at mbrown@rom.on.ca.

INTO THE WILD

A reflection on the astonishing diversity of our natural world

ROM'S PRESENTATION of the longest-running and most prestigious nature photography competition in the world enters its ninth year as *Wildlife Photographer of the Year* brings a new collection of breathtaking and awe-inspiring moments in nature. From vast, staggering landscapes to startling wildlife shots, the 87 prints capture the splendour of our natural world while provoking us to think about the human impact on the planet's biodiversity and the future of our interlinked world.



Reflection by Majed Ali, Kuwait
WINNER, ANIMAL PORTRAITS

Majed Ali (Kuwait) glimpses the moment a mountain gorilla closes its eyes in the rain.

Majed trekked for four hours to meet Kibande, an almost-40-year-old mountain gorilla. "The more we climbed, the hotter and more humid it got," Majed recalls. As cooling rain began to fall, Kibande remained in the open, seeming to enjoy the shower.

Mountain gorillas are a subspecies of the eastern gorilla, and are found at altitudes over 1,400 metres in two isolated populations—at the Virunga volcanoes and in Bwindi. These gorillas are endangered due to habitat loss, disease, poaching, and habitat disruption caused by human activity.

WILDLIFE PHOTOGRAPHER OF THE YEAR
NATURAL HISTORY MUSEUM

The intimate touch by Shane Kalyn, Canada
WINNER, BEHAVIOUR: BIRDS

Shane Kalyn (Canada) watches a raven courtship display.

It was midwinter, the start of the ravens' breeding season. Shane lay on the frozen ground, using the muted light to capture the detail of the ravens' iridescent plumage against the contrasting snow to reveal this intimate moment when their thick black bills came together.

Ravens probably mate for life. This couple exchanged gifts—moss, twigs, and small stones—and preened and serenaded each other with soft warbling sounds to strengthen their relationship or "pair bond."

Creation by Laurent Ballesta, France
WINNER, UNDERWATER

Laurent Ballesta (France) peers into the depths as a trio of camouflage groupers exit their milky cloud of eggs and sperm.

For five years, Laurent and his team returned to this lagoon, diving day and night to see the annual spawning of camouflage groupers. They were joined after dark by reef sharks hunting the fish.

Spawning happens around the full moon in July, when up to 20,000 fish gather in Fakarava in a narrow southern channel linking the lagoon with the ocean. Overfishing threatens this species, but here the fish are protected within a biosphere reserve.

Dawn of Life
My Pandemic Story
Face Masks

PART

2

DAWN OF LIFE

Art meets Science

By **Jean-Bernard Caron**

Artwork by Christian McCall.

HAVE YOU EVER WANTED TO TRAVEL back in time to a different world? Well, your wait is over. The Willner Madge Gallery, Dawn of Life, opening December 4 this year, will bring to life worlds that existed on our planet over the past four billion years. It will be a feast for the eyes, with about 1,000 fossil specimens on display, large murals, life-sized 3D models, and stunning animations of some of the most fantastic beasts and environments that the Earth has ever witnessed.

Each fossil has an extraordinary story to tell, starting with the amazingly small chance that each one had to become frozen in time—normally, when organisms die, their remains quickly decompose and get recycled through natural processes and very little is left behind, if anything at all. Entering the fossil record provides a real shot at a second—and nearly infinite—"life," but fossilization is an incredibly rare event. One problem is that fossilization is usually messy; organisms tend to fall apart quickly after death, or only certain parts of their bodies tend to be preserved. Even after fossilization, remains get compressed and distorted in the rocks, and often eroded or broken up at the surface if they are not discovered quickly. And sometimes, fossils are simply too small or difficult to see to untrained eyes. Considering all these problems, palaeontologists usually turn to palaeoartists to help them bring fossils to "life." In this process, palaeoartists collaborate with palaeontologists to recreate stunning visuals, such as paintings, 3D models, or animations.

These recreations are the ultimate tools for communicating what life was like in the past. Palaeontologists have always relied on artists to help share their discoveries with their fellow researchers and the public alike.

Creating accurate, lively visuals of how fossil organisms looked when they were alive is usually a tedious process, requiring a great deal of time and effort. It is a process that is grounded in the scientists' knowledge of the organisms and their environments, but requires the artists' touch to fill in the many unknowns, such as reconstructing missing body parts or colours that were not preserved. Because the colours of fossil organisms are so rarely preserved, artists often choose colours based on comparable environments or organisms living today to create a realistic picture.

For the Willner Madge Gallery, ROM has commissioned many original art pieces from a dozen of the most talented and acclaimed paleoartists in the world, starting with two of our very own staff: Danielle Dufault and Georgia Guenther. Dufault specializes in the rendering of fossil organisms and paleoenvironments in 2D. For the gallery, she worked on the creation of large murals of two of the most iconic Canadian UNESCO World Heritage sites, Miguasha (Quebec) and Joggins (Nova Scotia). Each of the giant graphic walls required hundreds of hours of work to depict the most intricate details of these environments. Guenther, on the other end, is a sculptor who uses traditional techniques and materials like wax for her artwork. She has been tasked with creating many 3D models, including the spectacular *Acutiramus,* a giant predatory arthropod which lived during the Silurian Period about 420 million years ago in what is now Ontario and New York State. Guenther's work is being cast in bronze by Artcast, a GTA-based company

specializing in lost-wax casting. The bronze models are meant to be touchable, so everyone can experience the creatures first-hand. The transformation of Guenther's original *Acutiramus* model from wax into bronze involved scanning the model and then 3D printing it at full size, about two metres long, using a pink resin that looks like bubble gum. This model, a little more durable than wax, was assembled, polished, and cleaned before being used to make a mould that the bronze could be poured into. Everyone in the team is eagerly waiting to receive the finished bronze models of *Acutiramus* and many other beasts from Artcast.

In addition to traditional sculpted models, Dawn of Life will showcase dozens of computer-generated models using the latest 3D-printing technology. These models were created by two very talented digital palaeoartists, coincidently both from Australia: Bruce Currie (Paleozoo) worked on Mistaken Point (Newfoundland and Labrador) and Lawrence Fields (Loom Animation) focused on the Burgess Shale (British Columbia). Many of these startling computer-generated models connected to the first two UNESCO World Heritage sites that you will encounter in the gallery will appear on graphics or touchscreens as single animations. Several dozens of these models were also sent to Objex Unlimited, a Toronto-based company, for 3D printing, and Guenther's hands often provided the final touches. The finished models are truly breathtaking and will help flesh out the fossils on display.

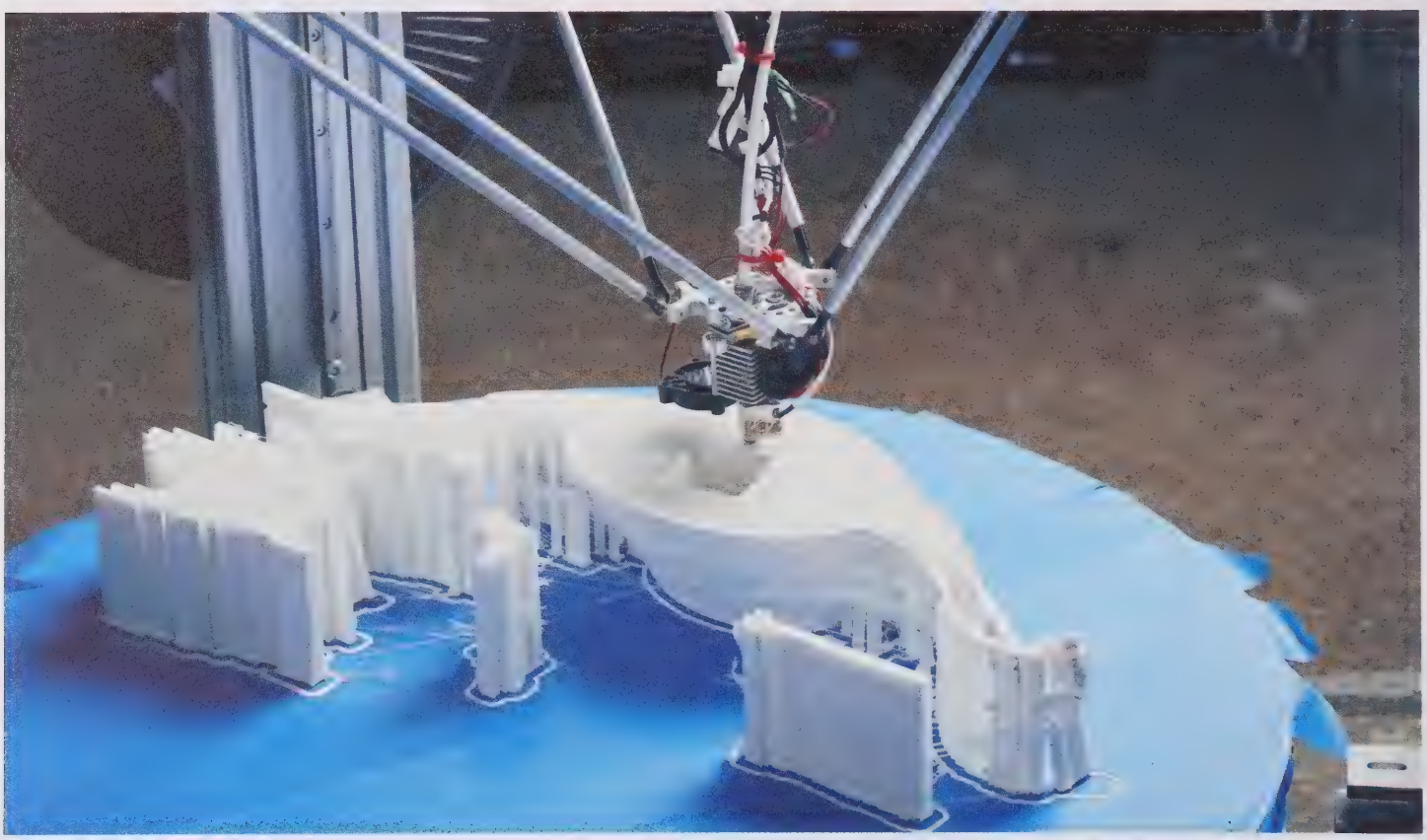
The half-billion-year-old Burgess Shale is my favourite site. The Burgess Shale collection is the world's largest, and new discoveries of global significance are made and published every year by ROM teams and students conducting field-based research there. This site will get a special treat when it comes to digital art. One of the most memorable features of the gallery will be an immersive recreation of the Burgess Shale environment along a 180-degree curved wall made of 36 OLED screens and covering nearly 30 square metres of screen area. The amphitheatre will be one of the largest installations of its kind in the world dedicated to recreating an ancient fossil community. Beautifully animated by Lawrence Fields, this feature will showcase 50 different species, representing some of the earliest animal forms on our planet and including some of the most bizarre-looking organisms you have ever seen, all interacting in the Cambrian Sea. You might even have a chance to see your oldest relatives, *Pikaia* and *Metaspriggina* in there!

These are only a few examples of artworks in this gallery. When you visit the new Willner Madge, Dawn of Life Gallery, look at the beautiful fossils, but also have a look at the reconstructions, models, and animations. They will help you imagine distant worlds from our very own planet.

Opens December 4

The Willner Madge Gallery, Dawn of Life is named in honour of Jeff Willner and Stacey Madge, who generously donated toward its creation. Located in the Peter F. Bronfman Hall on Level 2, it features almost 1,000 fossil specimens from ROM's world-class palaeontology collections.

These models were created for Dawn of Life by Georgia Guenther, the ROM sculptor and model maker. Back: *Cooksonia*, one of the first land plants. Right: the red algae *Waputikia* from the Burgess Shale. Front: A wax model of *Hylonomus*, the first reptile to lay eggs on land, from Joggins, Nova Scotia.



Toronto-based company Objex Unlimited was tasked with producing small and large 3D prints for Dawn of Life. Here, a cross-section of the body of the largest predator of the Cambrian period, *Anomalocaris canadensis*, from the Burgess Shale, is in the process of being printed. The finished model has been glued together, retouched, and painted by Guenther and measures nearly one metre in length!

Georgia Guenther stands next to *Acutiramus*, a distant relative of scorpions but which lived in the seas of southern Ontario and New York State about 421 million years ago. Guenther's wax model reconstruction is shown in the bottom right for comparison.

These are 3D printed resin models of multicellular organisms from Mistaken Point, a 565-million-year-old UNESCO World Heritage site in Newfoundland and Labrador. These models are used for creating a ceramic shell mould, which will then be filled with melted bronze (upper right).

The bronze is poured at temperatures reaching nearly 1,100° Celsius.

After a period of cooling, this is the first view of the bronze cast inside the ceramic shell mould. This is not the end of the process. The cast will then be cleaned and stained with a particular patina before final installation in the Dawn of Life gallery.

Understanding the COVID-19 pandemic through youth art

By **Justin Jennings**

The Face of Resilience
Valarie, Drawing
Thornhill

Colourful Mess
Aileen, Collage
North York

Smiling Under My Mask
Emmett, Drawing
Stoney Creek

MY PANDE

Eyedentity
Sabrina, Drawing
Toronto

Essential Barbie™
Kelia, 3D
Stoney Creek

Essential Still Life
Martha, Painting
Oshawa

MIC STORY

ON MARCH 14, 2020, ROM CLOSED ITS DOORS because of rising COVID-19 cases. We anticipated reopening three weeks later. We didn't.

None of us grasped what would soon happen: nearly 1.5 million Canadians infected, almost 30,000 deaths, billions of dollars lost. Pandemics within the pandemic followed—of health inequities, systemic racism, depression, and substance abuse—but there were also moments of hope, joy, and community.

Struggling to comprehend the pandemic, we looked to our fellow Ontarians. Many at ROM had been struck by how youth were navigating COVID-19, and how they expressed their feelings in ways that adults remained hesitant to. So we embarked on a crowd sourced exhibition—a first for the Museum—of art from 4–18 year-olds across Ontario. Over 2,300 youth submitted their art for the *#MyPandemicStory* exhibition.

ROM relied on expertise from across our staff in considering the artwork, as well as the backgrounds in art, child psychology, Indigenous education, mass media, social justice, and youth services of our external advisory council members: Melissa Grelo, Joanna Henderson, Aaron Sanqui, Christina Saunders, and Syrus Marcus Ware. Eni Agi, an up-and-coming Toronto artist, illustrated the exhibition.

The submitted art was a spectacular mix of paintings, sculptures, dances, videos, poems, and songs. Among the works, we saw raindrops on a windowsill, clenched fists raised in anger, a globe slathered in hand sanitizer, superheroes fighting the virus, a lone figure drowning in a sea of desperation, and a jubilant dancer spinning on an empty street. Boredom, anger, resolve, hope—every emotion was laid bare in the art, often in jumbles of highs and lows that we have also experienced over the long months of the pandemic.

Most of the youth who submitted art were stuck at home, away from family and friends, cut off from many of the things that they loved. For many, art was their salvation, a way for them to work through everything that was happening.

Exploring the submitted art could be a difficult journey—for every rainbow, there was an unrelenting storm—but ultimately, the journey proved a cathartic one. Their art gave us hope.

#MyPandemicStory is free and located just inside the Museum's Bloor Street entrance. Every submitted artwork is there digitally, with 50 entries on featured display. The featured artworks are arranged around recurrent themes in the submissions: relationships, positivity, struggle, perseverance, awareness, and pandemic life.

We hope exploring *#MyPandemicStory* provides the visitor with a window into how youth have experienced the COVID-19 pandemic. Their art helps all of us make sense of our own pandemic journeys and emphasizes that each of us travels along different, but often intertwining, paths. *#MyPandemicStory* has helped ROM find our footing, and we are delighted that so many of Ontario's youth were willing to share their portraits of a pandemic with our visitors.

Globe 2020
I wanted to show how much our world has changed since COVID started. I glued masks to a rubber ball representing Earth to show how we can't get out without wearing a mask (or at least shouldn't). I used hot glue to simulate hand sanitizer being poured onto our planet. My hopes are that people become more cautious about germs so this never happens again and that we may hug each other without worrying.
Estefania, 3D, Mississauga

Drowning in Isolation
The pandemic has taken over our lives, and it often feels like I'm "drowning" in everything COVID related. The surface filled with things from "before" is too far out of reach, and I don't know when I'll get them back.
Addie, Drawing, Oakville

Distressed
This art piece is very meaningful to me because it shows what emotions that I went through throughout COVID-19. I love to express my emotions through art because it makes me feel like a better version of myself. Some of the emotions I felt during COVID weren't very joyous, because I had been through a lot and I wasn't feeling the best so I wanted to show really strong emotions in my art piece.

Depressed, stressful, insecure, and knotted were some of the emotions I felt, so I wanted to create a really chaotic background with many colours. I chose to do lots of vibrant colours at the top because it shows how I felt first going into COVID, and then at the bottom, there are more dull and grey tones because that is how I felt during the middle. I made myself in the centre of the painting crying with a mask on. The reason that I was crying is because COVID and virtual school had a big impact on me. I decided to paint the mask with many colours because masks are a necessity nowadays. I felt like the mask was a big part of COVID and what's been going around in our world.

I chose to do glass painting because I wanted to try something different than what I usually like to do. I really liked glass painting because the colours really popped out rather than on a canvas. There were lots of emotions in the whole piece. I chose glass painting because glass is a very delicate and breakable object so it can break easily, and I wanted to show that in my art because during COVID, I felt like I was glass and each second I was scared I was gonna fall and shatter, but I didn't because I kept trying. COVID was really hard on me, and this piece of art really shows what challenges I have faced.
Aamina, Painting on glass, Milton

My Pandemic Story
For my artwork, I drew a girl blowing bubbles, through a purple tube, that are shaped like the COVID virus. This is to resemble the spread of COVID. The tube represents the area where someone inhales and exhales. The bubbles represent COVID-19. In this picture, the girl has already caught COVID, and is spreading it by blowing through the tube. It is a simple idea, but I think it is straightforward. COVID spreads very fast, but by wearing a mask, you can limit the risk of spreading COVID. This can also apply to my drawing. You require blowing air through the tube to blow bubbles, but when you are wearing a mask, it is very hard to do that. Therefore, less people will breathe COVID, just like less people will be exposed to the bubbles in my drawing. I hope that COVID will stop spreading so we can all return back to more normal lives instead of being stuck inside our houses for the majority of the day. It would be nice to socialize more and visit different places.
Laila, Drawing, Markham

Hell on Earth
My art depicts the hatred that so many people of the Black community face every day. More specifically, my painting zeroes in on the police brutality that killed hundreds of innocent Black fathers, mothers, and children during these past couple of years. Throughout the pandemic, racism against all minorities has become an even bigger problem, and my art represents the psychological and emotional side effects of this hate. Although we are giving racism a lot more public attention these days, it is not something new. Racism is a deep scar in our history.
Ibrahim, Painting, Mississauga

Entry to *#MyPandemicStory* is free to the public and there is no need to pre-book tickets to visit the show. Visit the exhibition next time you're in the neighbourhood!

FACE

By **Fahmida Suleman**

MASKS

Iconic Symbols of the Moment

Headwrap and mask ensemble by Catherine Addai, Kaela Kay. ROM 2021.79.21–2.

Since the start of the COVID-19 pandemic, makers, artists, and designers around the world have transformed face masks from essential protective devices into dynamic expressions of our lived experiences. Mask-making has allowed many to channel their creative energies and served as a form of healing, giving them a sense of purpose during this global crisis. Although ROM temporarily closed its doors to the public for several months, curators were busy researching and adding to their collections. Three of ROM's curators, Dr. Alexandra Palmer (Nora E. Vaughan Senior Curator, Global Fashion & Textiles), Dr. Sarah Fee (Senior Curator of Global Fashion & Textiles), and Dr. Fahmida Suleman (Curator of the Islamic World collections and lead curator of this exhibition), have brought together an international collection of over 250 non-medical face masks for the Museum. They have chosen 100 of these masks for ROM's exhibition *Unmasking the Pandemic: From Personal Protection to Personal Expression.*

ROM's collection of COVID-19 masks is truly global, representing 23 countries so far: Canada, China, Egypt, France, Ghana, Guatemala, India, Iran, Iraq, Japan, Jordan, Mexico, Morocco, Nigeria, Palestine, Philippines, Saudi Arabia, Syria, Turkey, United Arab Emirates, United Kingdom, United States, and Uzbekistan.

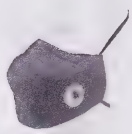
By collecting masks from around the world, ROM can share both personal stories of individual makers and more universal themes that represent humanity's resilience and unity during this global crisis. The exhibition is divided into four main themes: Poetry & Protest; Heroes & Warriors; Survival & Strength; and Artistry & Innovation. These themes allow visitors to experience masks in ways that they may not have imagined: as expressions of joy, heroism, activism, and cultural pride, and as symbols of hope and unity.

Numerous masks in the exhibition exemplify long-standing textile traditions. Left to right: Hand-embroidered mask made of pineapple cloth (piña), pineapple-silk (piña-seda), cotton, silk, and metallic thread by Beatriz "Patis" Pamintuan Tesoro, San Pablo City, Laguna, Philippines, 2020. Appliquéd cotton mask with an Islamic geometric pattern made by a tentmaker artisan (name unrecorded) for The Art of Khayamiyya, Cairo, Egypt, 2020. Hand-embroidered *suzani* mask on cotton with a stylized tulip and teapot by contemporary Uzbek artist Dilyara Kaipova, Urgut, Samarkand region, Uzbekistan, 2020.

By collecting masks from around the world, ROM shares both personal stories of individual makers and more universal themes that represent humanity's resilience and unity during this global crisis.

The themes of human vulnerability and loss appear on several masks in the exhibition. This non-medical COVID-19 cotton face mask is printed with the work of Iraqi–American artist Mohammed Al-Shammarey and features luggage sticker motifs that read "Fragile" and "Handle with Care." Al-Shammarey's artworks explore the consequences of political turmoil in Iraq and the surrounding region, as well as notions of Arab identity, and themes of mourning and loss. This mask references the fragility of human beings and the Earth during this global pandemic. Baghdad, Iraq/Houston, Texas, USA, 2020. Gift of the Kinda Foundation of Contemporary Arab Art.

Recycling, upcycling, and the use of sustainable materials are recurring concepts in the exhibition. This artwork, inspired by COVID-19 masks and the highly ornamental face-coverings worn by women of Qeshm Island in the Persian Gulf, was made by contemporary British–Iranian artist Bita Ghezelayagh. She used remnants of discarded vintage textiles, including Persian carpets and handwoven belts and trims, to create her face-veil and embellished it with mother-of-pearl discs. Ghezelayagh gives value to handcrafted textiles that are threatened by mass production and modern taste. Tehran, Iran/London, UK, 2020.



Ingeniously designed masks in the exhibition feature creative solutions that respond to specific needs of mask-wearers—from lip-reading masks to those easily worn over a Sikh turban. Helen Coxon, Senior Conservator at the ROM and an avid chorist, offered this mask for the exhibition. Designed by Diana Coatsworth, the cotton "Singer's mask" has a beak-like structure that keeps the cloth away from the mouth, permitting deep inhales and exhales while a vocalist sings. Toronto, Ontario, Canada, 2020. Gift of the Orpheus Choir of Toronto.

The exhibition celebrates the creativity of over 40 Canadian makers, including works by 15 Indigenous designers and artists. This intricately hand-beaded hat and mask ensemble by British Columbia–based Métis artist Lisa Shepherd is one of four specially commissioned artworks for the exhibition. Shepherd describes it as a "tough guy" hat and mask with Métis floral beadwork that channels feminine spirit, resilience, and generational nurturing. Maple Ridge, British Columbia, Canada, 2021. This acquisition is generously supported by the Susan Joan Greenberg Fund.

Many masks in the exhibition tell meaningful stories about cultural identity. This handcrafted mask by Inuvialuk artist Taalrumiq (Christina King), entitled *Unmasking Identity,* is a celebration of Inuvialuit identity. It is made from sealskin, fox fur, wolverine fur, polar bear fur, leather, reindeer antler, caribou fur, ptarmigan feathers, duck feathers, fish vertebrae, dentalia, sterling silver filigree cones, Swarovski crystal bicones, glass seed, rondelle and bicone beads, black curb chain, fabric, and sequins. Tuktoyaktuk, Northwest Territories, Canada, currently a guest on Lheidli T'enneh traditional territory, Prince George, British Columbia, Canada, 2021. This acquisition is generously supported by the Susan Joan Greenberg Fund.

Unmasking the Pandemic: From Personal Protection to Personal Expression runs until March 27, 2022, in the Thorsell Spirit House. Entry to the exhibition is free to the public, and there is no need to pre-book tickets to visit the show.

Supporting Sponsor
Hal Jackman Foundation

ROM 2021.721.

PART

3

A NEW ERA OF DISCOVERY

ROM was founded in 1914 on the vision of dedicated philanthropists and volunteers. It dawned because our community cared and offered the support to make it happen. And this December, we come full circle, as the passion and generosity of our donors have fully enabled the highly anticipated opening of the Willner Madge Gallery, Dawn of Life.

As the first new permanent gallery in more than a decade, Dawn of Life will mark a new era of discovery and discourse at ROM. It will be the only one of its kind in North America dedicated to tracing the story of life, from its earliest beginnings about four billion years ago to the first appearance of mammals and dinosaurs. This is a narrative that is both global in relevance and deeply Canadian—many of the fossils on display originate from sites across our country—and it could be told only at ROM.

More than 100 donors gave generously to make this new gallery possible, with gifts ranging from $5 to $10 million. They ranged from enthusiastic schoolchildren to leadership donors Jeff Willner and Stacey Madge, Richard M. Ivey & Family, The Salamander Foundation, Brookfield Partners Foundation, Rob Pitfield & Family, Elinor Gill Ratcliffe, TD Bank Financial Group, The Dorothy Strelsin Foundation, Louise Hawley Stone Charitable Trust, Jennifer Ivey Bannock, Albert and Barbara Milstein & The Polk Family Foundations, Anne Y. Lindsey, and Robert J. Dickinson Pyne. Each donor believed in ROM's goal to present the story of early life through this ambitious gallery—a story that belongs to everyone.

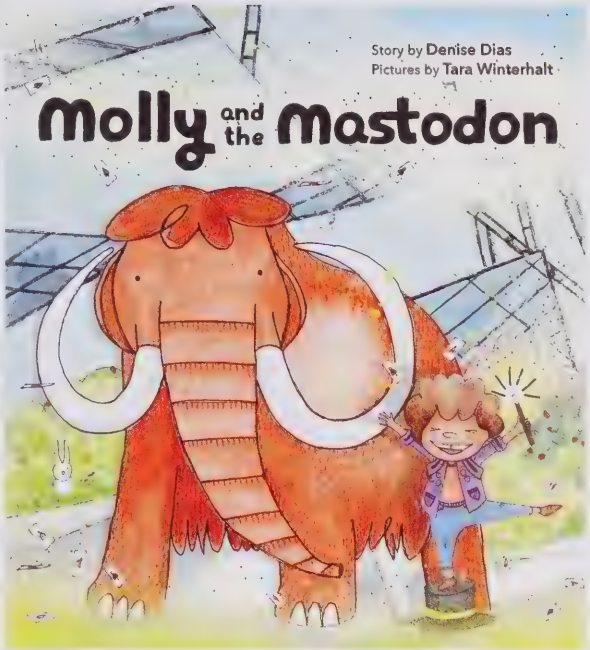
Innovative and experiential, Dawn of Life will be a highlight for ROM—and time-traveller visitors—for decades to come. We are thrilled to celebrate its opening at our spectacular ROM Ball on December 3 and with the public the following day. The gallery will also be the subject of a short documentary produced by renowned filmmaker Barry Avrich, which will chronicle the making of our world and this exciting new space.

This will be my last ROM magazine message to you as President and CEO of ROM Governors, as I am retiring at the end of December. Serving you over the past seven years has provided an extraordinary experience, filled with wonderful people and endless learning. It's truly been a rare privilege and a great pleasure, and I will continue to be a part of ROM as a member of the Currelly Legacy Society and the Royal Patrons Circle.

Thank you for your commitment, support, and friendship. I'm confident that I leave our Museum and Governors in great hands, and on the cusp of a wonderful future as Canada's twenty-first-century world museum.

Susan

Susan Horvath
President & CEO, ROM Governors



MOLLY AND THE MASTODON

"On the weekends, Molly's grandma takes her to the museum. It's a special time together to learn new things and explore ideas. Molly brings her notebook to sketch specimens and collect interesting facts. Grandma says the whole world is full of magic if you just look for it."

This excerpt from ROM's newly published children's book, *Molly and the Mastodon* captures the spirit behind Nita and Don Reed's generous gift that supported its publication. As long-standing supporters of the Museum, the Reeds have always seen the Museum as a magical place for learning that they love to visit with their five grandchildren, to whom the book is dedicated.

"We have been proud supporters of this amazing Museum in many different ways since Nita began volunteering here more than 25 years ago. Enabling the creation of a captivating yet educational book like *Molly and the Mastodon* holds a special place in our hearts, because it's a charming way to connect children and their families to ROM, and bring a piece of the Museum home. What a privilege to recognize our grandchildren, and what an ongoing joy to read this book with them."

While the Reeds have also supported the publication of another ROM children's book, this one holds a special place in their heart with Molly, the protagonist, named after one of their grandchildren, and the story taking place in the gallery named in recognition of their generous support, the Reed Gallery of the Age of Mammals. The story follows Molly and her grandmother during their visit to the gallery when the mighty mastodon comes to life and takes Molly on a magical journey through the world of mammals. *Molly and the Mastodon* is written by Denise Dias and illustrated by Tara Winterhalt.

This most recent gift is part of the Reeds' long history of philanthropy at ROM, which includes thoughtful donations to various areas of the Museum.

Known to step up and support important initiatives, Nita and Don also supported ROM's Welcome Project in 2017 with a generous gift in support of the revitalization of the Bloor Street Plaza, later named the Reed Family Plaza. Their gift was key to moving this project forward and created a new way for visitors to enjoy ROM. With a keen interest in whales, the Reeds also contributed to the Blue Whale Project with a special gift to help salvage the blue whale that had washed ashore in Newfoundland and prep it for display in the extraordinarily popular exhibition *Out of the Depths: The Blue Whale Story*. And most recently, they were Lead Exhibition Patrons of the current *Great Whales: Up Close and Personal,* the major exhibition that helped welcome families back to the Museum after months of closure. Caring deeply about the vibrancy of the Museum in the future, Nita and Don have also made a provision to support ROM through their estates.

Equally as impressive as their philanthropy is Nita's nearly three-decade involvement as a ROM volunteer. She initially joined the Department of Museum Volunteers, where she sat on the Executive Committee for many years, and then went on to become a ROM Trustee. She has also served on numerous committees including the Bishop White Committee Executive, the Currelly Legacy Society Executive, and the ROM Golf Classic Committee. Nita and Don are Honorary Governors of ROM. Nita's incredible experience, expertise, and leadership have been invaluable and have contributed to many successful initiatives and events.

Nita and Don's dedication, philanthropic leadership, and continued support over the years have had an incredible impact on the Museum. Their thoughtful, expansive approach as philanthropists and Nita's many contributions as a volunteer leader have made ROM a better place for everyone and will truly leave a lasting legacy—one filled with magic.

Molly and the Mastodon is available now at all major bookstores and ROM Boutique. All proceeds support the Museum.

LIVES & LEGACIES: A PLACE TO CALL HOME

Jean Read still remembers the exact moment she fell in love with ROM. A labour relations expert, she was attending her first meeting as a member of ROM's Board of Trustees Human Resources and Labour Relations Committee.

Jean had never given the Museum much thought before then, but when she looked up at the wondrous mosaic ceiling of the historic rotunda for the first time, it was no longer a matter of joining an interesting committee; this was a place she wanted to call home.

"It was just so beautiful that I said to myself, 'This is where I belong,'" she recalls.

Jean's affection for ROM only grew stronger as she became more involved with the Museum, first as a trustee in the 1990s and later as a member of the Department of Museum Volunteers. Along the way, she has helped guide ROM through a critical period of growth and transformation that includes the opening of the Michael Lee-Chin Crystal and the revitalization of the historic Weston Entrance. But her favourite highlight, she says, is ROM's remarkable evolution from an institution with a limited audience to a more open and inclusive space that is accessible to the whole community.

"In the old days, the building used to be so dark and closed, it felt like you were meant to learn, but not have fun," she recalls. "Museums should be open and a delightful experience for everyone. If children enjoy themselves, they'll learn anyway."

Jean's legacy also includes philanthropy. Through her involvement on the Board of Trustees, she became acquainted with the Currelly Legacy Society, a group of dedicated donors who have named ROM in their estate plans. Their philanthropy helps to preserve the Museum as a vital and vibrant hub of culture and community for future generations. In 2010, she became the Chair of the Executive Committee and through her leadership, has inspired many planned gifts. So when her beloved partner, Morris, passed away in 2009, she knew exactly how she wanted to honour his memory.

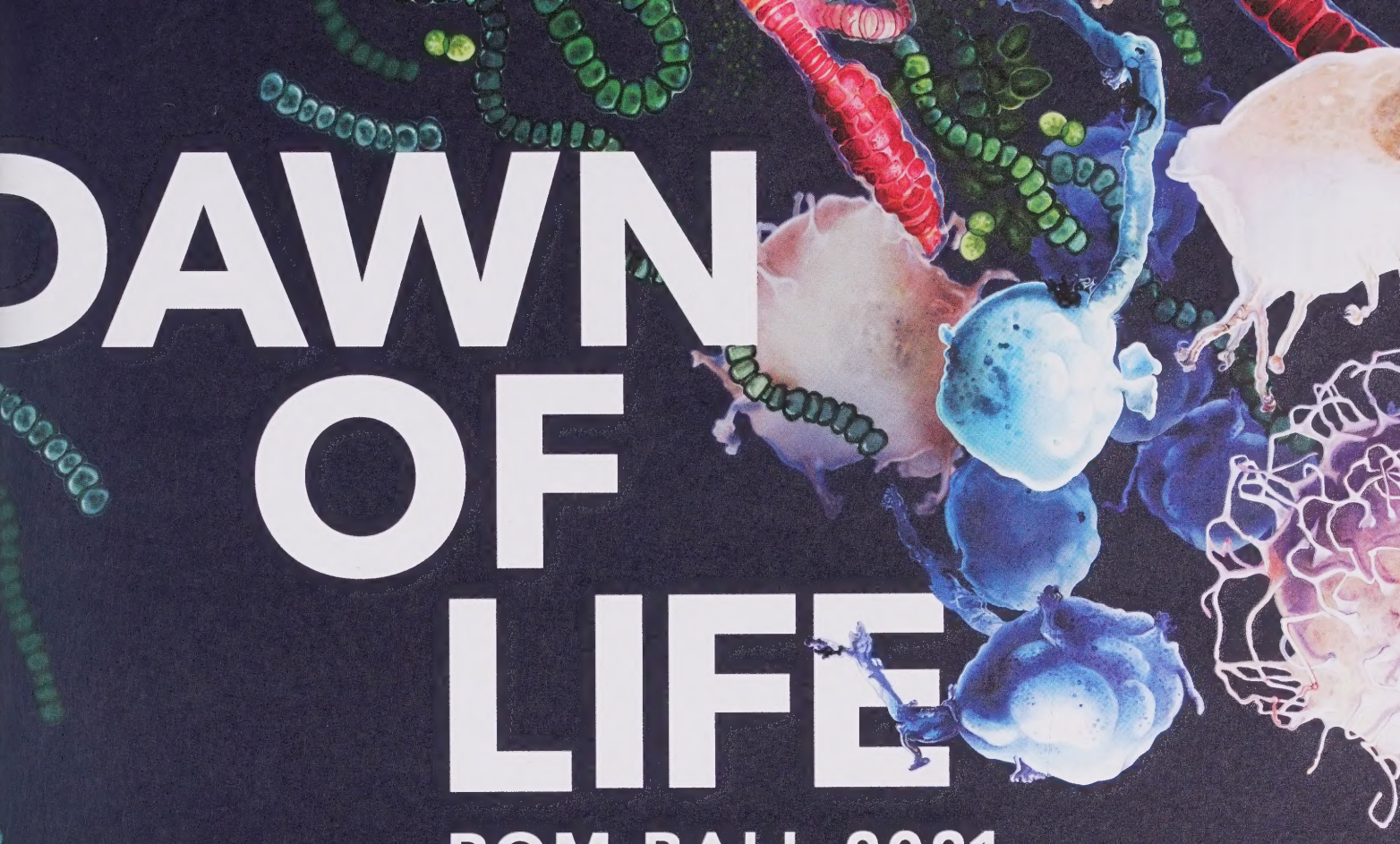
"Morris and I shared a love of whale watching," she recalls. "I have so many wonderful memories of driving up and down both coasts to see them in their glory. It was important to me to find a way to memorialize both his name and his passion for all time."

In 2010, Jean made a significant donation that supported ROM's presentation of the exhibition *Out of the Depths: A Blue Whale Story.* More recently, she established the Jean Read and Morris Appleby Whale Fund to support the field collection, acquisition, care, and storage of whale specimens. Jean has also generously named ROM as a beneficiary of her Registered Retirement Income Fund, thereby retaining control over her assets throughout her lifetime. Through these commitments, she also gains access to exclusive CLS benefits such as lectures and luncheons.

"ROM has been a second home for me, a place to not only learn but also build lasting friendships," says Jean. "Through my gift, I hope I can help ROM continue to thrive so that others may make it their home, too."

To learn more about leaving a legacy at ROM, contact Janice Correa at janicec@rom.on.ca.

Gift of Retirement Funds
By naming ROM as a beneficiary of all or a percentage of your qualified retirement plan, you can minimize your family's tax burden while supporting the future of ROM.



DAWN OF LIFE

ROM BALL 2021

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Jennifer Ivey Bannock
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Justin Poy
Christopher Sherman

4 BILLION YEARS AGO, BEFORE WE WERE HAVING A BALL, THEY WERE HAVING A BALL.

The dazzling ROM Ball welcomed over 450 people to celebrate the landmark new Willner Madge Gallery, Dawn of Life on December 3, 2021. Visit the ROM to see this spectacular, history-making gallery.

Thank you to our sponsors, our guests and our dedicated committee for creating an evening to remember!

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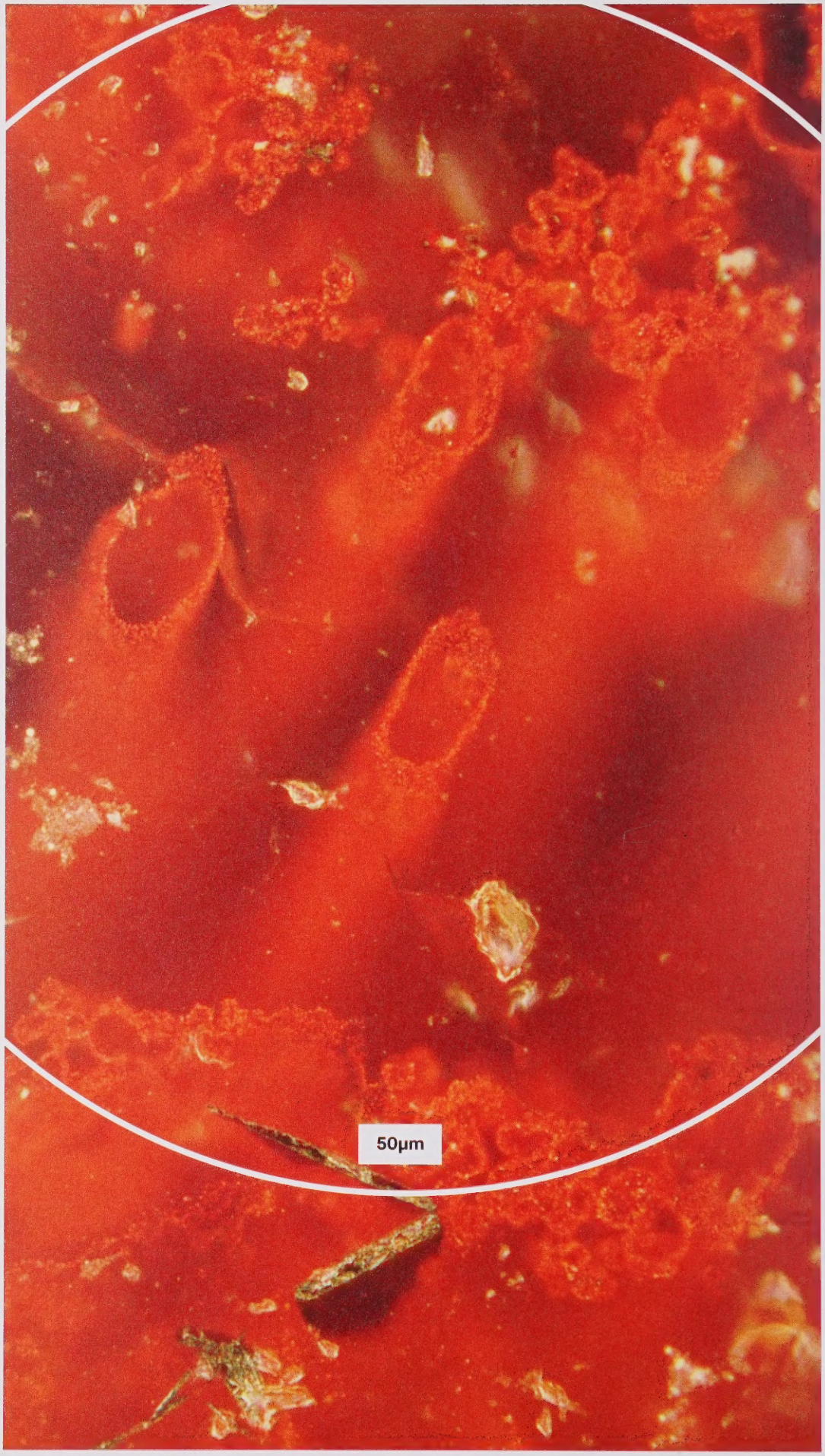
WHAT'S SO SPECIAL ABOUT THIS ROCK?

You're looking at a magnified image of the oldest evidence of life on Earth—about four billion years old. This rock, collected in northern Quebec, contains tiny fossilized tubes. Bacteria likely formed these tubes, at a time when Earth's atmosphere had no oxygen.



Banded iron formation with tubular microfossils (close-up image).

Inukjuak, Quebec, Canada.

Hadean to early Archean, 4.28–3.77 billion years old.

Gift of Dr. Jonathan O'Neil and the Pituvik Landholding Corporation of Inukjuak.

THANKS FOR GOLFING FORE THE ROM

Thank you to everyone who participated in the sixth annual ROM Classic Golf Tournament on September 13, 2021.

This remarkable year brings our total funds raised to date to more than $700,000—an incredible success story made possible by our supporters! Your generosity—now more than ever—has a tremendous impact, enabling diverse communities to discover and delight in art, culture and nature at their Museum. Congratulations to all our winners and we'll see you again next year!

Thank you to our ROM Classic Committee

Mark Baxter
Sunny Dhillon
Chris Doyle
Balu Patel
Suni Patel
Nita Reed
Thomas Robson
Dan Wright

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[SOLANDER]

This exhibition is organized by Curatorial Exhibitions, Pasadena, California in association with the Solander Collection.

Left: *Catalonian Man*, Barcelona, 1856 Salt Print from a glass negative Louis-Pierre-Théophile Dubois de Nehaut Belgium. Courtesy of Solander Collection. Top right: *A Bride Dances*, around 1937. Vintage gelatin silver print. Emilio Amero, Mexico (1901-1976). Emilio Amero Estate, Courtesy of the Solander Collection. Bottom right: *NYC*, 1948. Vintage gelatin silver print. Robert Frank, Switzerland, Andrea Frank Foundation Courtesy of Solander Collection. The ROM is an agency of the Government of Ontario.